# Quadro

## The IP PBXs

# Manual I:
# Installation Guide

for Quadro2x, 2xi;
Quadro4x, 4xi, 4xa, 4xia, 4xs, 4xis;
Quadro16x, 16xi, 16a, 16xia, 16xs, 16xis;

SW-Version 3.1.x

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### FCC Statement (Part 15) Class B

The Epygi Quadro2x, Quadro2xi, Quadro4x, and Quadro4xi have been tested and found to comply with the limits for a class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which is found by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the device.
- Connect the equipment to an outlet on a different circuit from the receiver.
- Consult a dealer or an experienced Radio/TV technician for assistance.

You are cautioned that any change or modification to the equipment not expressly approved by the manufacturer could void the user's authority to operate this device.

### FCC Statement (Part 15) Class A

- The Epygi Quadro16x has been tested and found to comply with the limits for a class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a commercial installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which is found by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the aforementioned measures.

You are cautioned that any change or modification to the equipment not expressly approved by the manufacturer could void the user's authority to operate this device.

### Administrative Council for Terminal Attachments (ACTA) Customer Information

This equipment complies with Part 68 of the FCC rules and the requirements adopted by the ACTA. On the back of this equipment is a label that contains, among other information, a product identifier in the format US:AAAEQ###TXXXX,

made out to HX7OT00BHX70100. If requested, this number must be provided to the telephone company.

Any plug or jack that is used to connect this equipment to the premises wiring and telephone network must comply with the applicable FCC Part 68 rules and requirements adopted by the ATCA.

The Ringer Equivalence Number is an indicator of the maximum number of devices allowed for connection to a telephone interface. The termination on an interface may consist of any combination of devices subject only to the requirements that the sum of the RENs of all the devices does not exceed five. Excessive RENs on a telephone line may result in the devices not ringing in response to an incoming line. The REN for this product is part of the product identifier that has the format US:AAAEQ###TXXX, made out to HX7OT00BHX70100. The digits represented by ### are the REN without a decimal point (in this case 00B is a REN of 0.0B.)

If the Quadro causes harm to the telephone network, the telephone company will notify you in advance that a temporary discontinuance of service may be required. But if advance notice isn't practical, the telephone company will notify the customer as soon as possible. Also, you will be advised of your right to file a complaint with the FCC if you believe it is necessary.

The telephone company may make changes in its facilities, equipment, operations or procedures that could affect the operation of the equipment. If this happens, the telephone company will provide advance notice for you to make the necessary modifications to maintain uninterrupted service.

Connection to a party line service is subject to state tariffs. Contact the state public utility commission, public service commission or the corporation commission for information.

If your home has specially wired alarm equipment connected to the telephone line, ensure the installation of the Quadro does not disable your alarm equipment. If you have any questions about what will disable alarm equipment, consult your telephone company or a qualified installer.

### Electrical Safety Advisory

To reduce the risk of damaging power surges, we recommend you install an AC surge arrestor in the AC outlet from which the Quadro is powered.

### Industry Canada Statement

This product meets the applicable Industry Canada technical specifications.

### Safety Information

Before using the Quadro, please review and ensure the following safety instructions are adhered to:

- To prevent fire or shock hazard, do not expose your Quadro to rain or moisture.
- To avoid electrical shock, do not open the Quadro. Refer servicing to qualified personnel only.
- Never install wiring during a lightning storm.
- Never install telephone jacks in wet locations unless the jack is specified for wet locations.
- Never touch uninsulated telephone wire or terminals unless the telephone line has been disconnected at the network interface.
- Use caution when installing or modifying cable or telephone lines.
- Avoid using your Quadro during an electrical storm.
- Do not use your Quadro or telephone to report a gas leak in the vicinity of the leak.
- An electrical outlet should be as close as possible to the unit and easily accessible.

### Emergency Services

The Quadro SIP Service is intended to function as a secondary telephone service. This services is made available through the Internet and therefore are dependent upon a constant source of electricity and network availability. If a power outage occurs, the Quadro SIP Service automatically will be disabled. User understands in the event of a power or network outage, the Quadro SIP Service will not support 911 emergency services, and further, such services only will be available via the user's regular telephone line that is not connected to the Quadro. User further acknowledges that any interruption in the supply or delivery of electricity or network availability is beyond Epygi's control and Epygi shall have no responsibility for losses arising from such interruption.

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## Manual II: see Administrator's Guide

Describes in detail the menus available for administrators only, further, it includes all the system's default values at a glance.

## Manual III: see Extension User's Guide

Describes in detail the menus available for extension users, further, it includes all the call codes at a glance.

# About This Installation Guide

This Installation Guide explains the installation of the Quadro IP PBXs of Quadro2x, Quadro4x and Quadro16x series. The Quadro models differ both in their feature sets and the number of phone lines and extensions that are supported:

- **Quadro2x** offers 1 phone line (FXO), 2 phone extensions (FXS) and 1 Ethernet WAN port
- **Quadro2xi** offers 1 phone line (ISDN), 2 phone extensions (FXS) and 1 Ethernet WAN port
- **Quadro4x** supports 2 phone lines (FXO), 4 phone extensions (FXS) and 1 Ethernet WAN port - a special version of Quadro4x offers 2 additional FXO lines
- **Quadro4xi** supports 1 phone line (ISDN), 4 phone extensions (FXS) and 1 Ethernet WAN port
- **Quadro4xa** supports 2 phone lines (FXO), 4 phone extensions (FXS) and 1 ADSL WAN port
- **Quadro4xia** supports 1 phone line (ISDN) 4 phone extensions (FXS) and 1 ADSL WAN port;
- **Quadro4xs** supports 2 phone lines (FXO), 4 phone extensions (FXS) and 1 G.SHDSL WAN port
- **Quadro4xis** supports 1 phone line (ISDN) 4 phone extensions (FXS) and 1 G.SHDSL WAN port
- **Quadro16x** supports 4 phone lines (FXO), 16 phone extensions (FXS) and 1 Ethernet WAN port
- **Quadro16xi** supports 3 phone lines (ISDN), 16 phone extensions (FXS) and 1 Ethernet WAN port
- **Quadro16xa** supports 4 phone lines (FXO), 16 phone extensions (FXS) and 1 ADSL WAN port
- **Quadro16xia** supports 3 phone line (ISDN), 16 phone extensions (FXS) and 1 ADSL WAN port
- **Quadro16xs** supports 4 phone lines (FXO), 16 phone extensions (FXS) and 1 G.SHDSL WAN port
- **Quadro16xis** supports three phone line (ISDN), 16 phone extensions (FXS) and 1 G.SHDSL WAN port

The installation procedure for all Quadro IP PBXs is the same. Throughout this Installation Guide, the standard edition of Quadro4x with two FXO ports is shown as the reference system.

This Installation Guide gives step-by-step instructions to provision the Quadro and configure the phone extensions with the Epygi SIP Server. After successfully configuring the Quadro, a user will be able to make SIP phone calls to remote Quadro devices, make local calls to the PSTN and access the Internet from devices connected to the LAN.

This Installation Guide neither describes the PBX, Auto Attendant, Call Relay, and Voice Mail features of the Quadro nor does it provide advanced firewall and VPN configuration information. For these features, refer to the Administrator's and Extension User's Guides.

Step 1: Installing the Quadro explains the connection of cables and devices to the Quadro.

Step 2: Configuring the Quadro describes the configuration steps necessary to integrate the Quadro into your network environment.

Step 2-A: Using IP Lines explains how to configure IP lines on the Quadro IP PBX and to connect IP phones to become functional in the Quadro's LAN.

Step 2-B: Using ISDN Lines explains how to configure ISDN trunks and to define a default outgoing MSN.

Step 2-C: Using an ADSL or G.SHDSL Uplink explains the additional WAN specifications needed if using a Quadro IP PBX with an ADSL Internet Uplink.

Step 3: Registering on Epygi's Technical Support shows you how to access the Epygi Technical Support Center and the Epygi SIP Server.

Step 4: Making/Receiving Calls explains how to enable the Quadro's various telephony features.

Appendix: PC DHCP Settings explains how to configure your PC to access the Quadro Configuration GUI.

Appendix: Changing the Admin Password explains how to change the default administrator password.

Appendix: Configuring NAT Traversal explains configuration of the Quadro if it is placed behind a NAT enabled router.

Appendix: Registering on Epygi's SIP Server explains how to register on Epygi's powerful SIP server.

Appendix: Checking the Connections gives hints on solving common problems.

## Requirements

- One 120/240 VAC power outlet in close proximity to the Quadro.
- One RJ45 Ethernet 10/100 broadband Internet connection, an ADSL Internet connection or a G.SHDSL Internet connection.
- At least one RJ11 telephone connection is recommended to connect the Quadro to the PSTN network (all Quadro IP PBXs with FXO ports). For ISDN Quadros an RJ45 CAT 5 cable is needed to connect Quadro to ISDN.
- At least one off-the-shelf analog phone with an RJ11 telephone cable.
- One CAT 5 Ethernet cable with an RJ45 connector to connect to the Quadro LAN port.
- One PC with a 10/100 Mbps Ethernet card or adapter installed.
- TCP/IP network protocol installed on each PC.
- For optimal results, Internet Explorer 5.5 or higher, or Netscape Navigator 4.7 or higher are recommended.

**Please Note:** All Quadro IP PBXs are shipped with one RJ11 cable and one straight RJ45 CAT 5 cable. If the LAN connector of the Quadro connects to a hub or switch, a crossover cable may be required.

Other cables are added according to the different connectivity requirements of the Quadro IP PBX types.

# Hardware Overview

## The Rear Panels of Quadro2x, 4x and 16x

Including the rear panel of Quadro4x' special edition with two additional FXO ports.

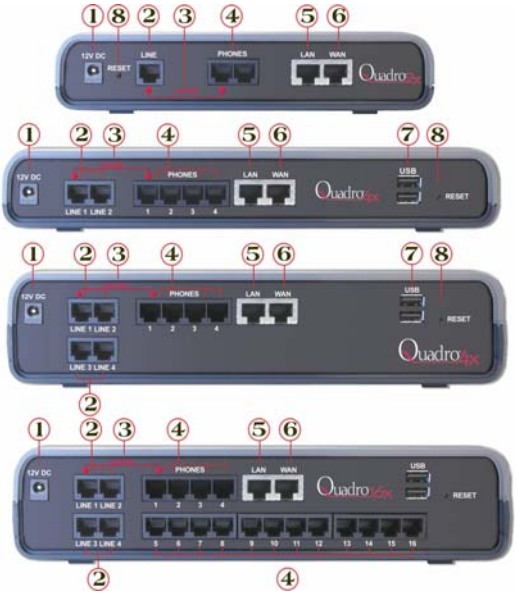



Fig. I-1: Quadro's Rear Panels (1)

**1** Power supply socket. **Use only the power adapter delivered with the Quadro**.

**2** LINE sockets to connect the Quadro to the PSTN network using standard analog phone service. These are FXO (Foreign Exchange Office) analog ports.

**3** In the event of a power failure, PHONE 1 is connected to LINE 1, allowing the phone to send/receive phone calls directly to the PSTN network. PHONE 1 is powered by the PSTN.

**Please Note:** Only LINE 1 is connected to PHONE 1 during a power failure. The other LINE and PHONE ports are not connected together.

**4** PHONE sockets with RJ11 connectors enable connectivity of regular analog telephones. These are FXS (Foreign Exchange Station) analog ports. As a factory default, the phones connected to PHONE sockets 1-3 (1-2 for Quadro2x) are configured as voice extensions. PHONE socket 4 is preconfigured for a fax machine.

**5** RJ45 socket to attach to the Local Area Network (LAN) via an Ethernet CAT 5 cable. If a PC is connected directly to this socket, a straight cable is used. If an Ethernet hub, router or switch is used, a crossover cable may be required.

**6** RJ45 socket to attach the Internet Uplink (WAN) via an Ethernet CAT 5 cable.

**7** The USB socket enables connectivity of USB flash memory providing expansion for additional voice mails and record data. Refer to the Administrator's Guide for supported devices.

**8** The Reset button may be used in two ways: (1) to initiate a normal reset or (2) to carry out a factory reset. A normal reset is executed by pressing the Reset button with a paper clip for an instant.

Pressing the reset button and holding it down for seven seconds or more will execute

a factory reset. This will restore the factory defaults and clear all settings including the IP address and the administration password you entered.

**Please Note:** A Factory Reset forces the default LAN IP address of 172.30.0.1 and default admin password of 19

## The Rear Panels of Quadro2xi, 4xi and 16xi

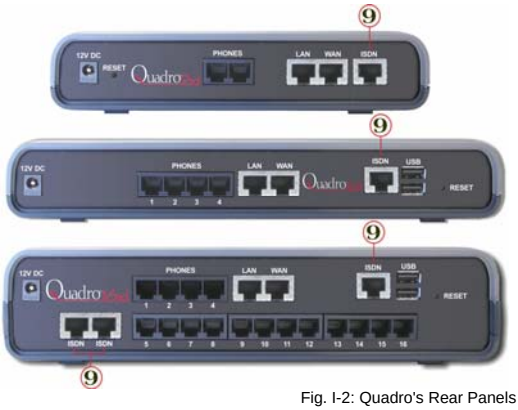



Fig. I-2: Quadro's Rear Panels (ISDN/Ethernet flavors)

**9** RJ45 socket(s) to connect the Quadro to the ISDN-PSTN network using a digital phone service.

## The Rear Panels of Quadro4xa and 16xa

Fig. I-3: Quadro's Rear Panels (FXO/ADSL flavors)

**10** RJ11 socket to connect the Quadro via ADSL to the Internet.

## The Rear Panels of Quadro4xia and 16xia

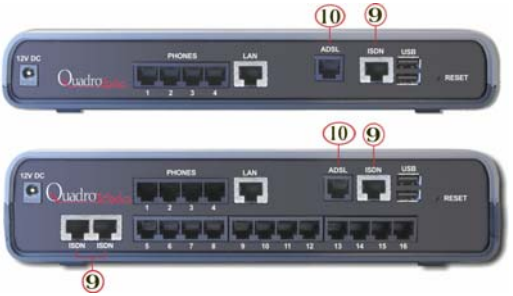



Fig. I-4: Quadro's Rear Panels (ISDN/ADSL flavors)

**9** RJ45 socket(s) to connect the Quadro to the ISDN-PSTN network using digital phone service.

**10** RJ11 socket to connect the Quadro via ADSL to the Internet.

## The Rear Panels of Quadro4xs and 16xs

Fig. I-5: Quadro's Rear Panels (FXO/G.SHDSL flavors)

**11** RJ11 socket to connect the Quadro via G.SHDSL to the Internet.

## The Rear Panels of Quadro4xis and 16xis

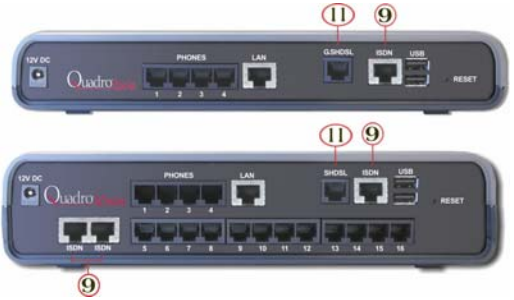



Fig. I-6: Quadro's Rear Panels (ISDN/G.SHDSL flavors)

**9** RJ45 socket(s) to connect the Quadro to the ISDN-PSTN network using digital phone service.

**11** RJ11 socket to connect the Quadro via G.SHDSL to the Internet.

## Quadro's Front Panel LEDs

Fig. I-7:Quadro's Front Panel LEDs

| | | | |
|---|---|---|---|
| **1** | **Busy**<br>green<br>Status of CPU | | **off**: no power<br>**on or blinking**: normal activity |
| **2** | **Info**<br>yellow<br>System information | | **on**: device is booting<br>**off**: no information<br>**blinking**: an event occurred; details specified in the System Event section of the Management interface |
| **3** | **Fault**<br>red<br>System status | | **on** either an error or the device is booting<br>**off**: no error<br>**blinking**: system unusable |
| **4** | **USB**<br>green<br>Status of the USB interface | | **on**: USB memory device installed correctly<br>**off**: no USB memory device found<br>(Quaro2x: not used) |
| | **PWR** (Quadro2x only)<br>green<br>Status of the power supply | | **on**: power supply ok<br>**off**: no power supply or device is still booting<br>(Quadro2x only) |
| **5** | **LAN**<br>green<br>Status of the LAN interface | | **on**: link ok<br>**off**: no link<br>**flickering**: traffic on the link |
| **6** | **WAN**<br>green<br>Status of the WAN interface | | **on**: link ok<br>**off**: no link<br>**flickering**: traffic on the link<br>(all Quadro IP PBXs except XDSL flavors) |
| **7** | **Line1**<br>green | Status of the:<br>FXO LINE (Quadro2x)<br>FXO LINE 1 (Quadro4x, 4xa, 4xs)<br>FXO LINE 1 or 2 (Quadro16x, 16xa, 16xs, 4x special edition) | **on:** line in use<br>**off**: line not in use |
| | | Status of the first B-Channel of ISDN (Quadro2xi, 4xi, 4xia, 4xis, 16xi, 16xia, 16xis) | **on:** at least one B-channel active (Line1 and Line2 on: all B-channels are active, no additional call possible)<br>**off:** no call in progress<br>**flickering** (both, Line1 and Line2): no connection to PSTN |
| **8** | **Line2**<br>green | Status of the:<br>FXO LINE 2 (Quadro4x, 4xa, 4xs)<br>FXO LINE 3 or 4 (Quadro16x, 16xa, 16xs, 4x special edition)<br>(Quadro2x: not used) | **on**: line in use<br>**off**: line not in use |
| | | Status of the second B-Channel of ISDN (Quadro2xi, 4xi, 4xia, 4xis, 16xi, 16xia, 16xis) | **on:** at least one B-channel active (Line1 and Line2 on: all B-channels are active, no additional call possible)<br>**off:** no call in progress<br>**flickering:** (both, Line1 and Line2): no connection to PSTN |

### LED indication during a firmware update

A firmware update is indicated by the red (**Fault**) and yellow (**Info**) LEDs. Both will blink simultaneously for about two minutes while the firmware is being updated. The Quadro will then reboot automatically showing the boot LED sequence.

### LED indication during a boot sequence

A boot sequence is indicated as follows: The red **Fault** LED will glow for a few seconds, then the yellow **Info** LED will glow for another 4 or 5 minutes while the green **Busy** LED is blinking. Once the **Info** LED is off, the boot sequence has been completed successfully.

### LED indication during uploading an emergency firmware

The red **Fault** LED and the yellow **Busy** LEDs will stop blinking alternately and start blinking in parallel. This shows that Quadro has accepted the emergency firmware and is loading it. After a few seconds, Quadro will boot, indicated as follows: The red **Fault** LED will glow for a few seconds, then the yellow **Info** LED will glow for another few seconds while the green **Busy** LED is jittering. When the yellow **Info** LED extinguishes, the boot sequence has been completed successfully.

# Step 1: Installing the Quadro

## Networking Overview

To establish a connection between the Internet and your local area network (LAN), an access router is needed. The Quadro IP PBX serves, among other functions, as an access router, and will perform the task of connecting your LAN, or a group of one or more PCs, to the wide area network (WAN) or the Internet. The Quadro will process and regulate the data traffic between these two networks. All Quadro IP PBXs have one LAN port that can connect to Ethernet hubs and switches on the LAN, allowing additional devices to be connected to the network.

The Quadro is a device with two sides: one side connects to your LAN, and the other side connects to the Internet, or the WAN. Quadro's firewall and Network Address Translation (NAT) functionality protects your LAN from being seen from the Internet side making the LAN private and secure.

The Ethernet WAN port transmits up to 10 Mbps, and the LAN port transmits at 10 Mbps or 100 Mbps. The ADSL and G.SHDSL WAN port will adjust to the transmission rates that are available.

Every device within an IP network requires a unique IP address to identify itself. Since the Quadro connects to both the LAN and the WAN, it has to be part of both networks, and must have two IP addresses: one for the WAN side and one for the LAN side. The Quadro's integrated firewall/NAT functionality will hide the LAN IP address from the WAN (Internet) side.

There are two ways of assigning an IP address: statically or dynamically.

A Static IP address is a fixed, manually assigned IP address that remains valid until changed. If you plan to use the Quadro as your Internet access router, contact your Internet Service Provider (ISP) to find out if a static IP address is assigned to your account. If so, you will need this static IP address when configuring the Quadro device.

A dynamic IP address is a temporary address that is automatically assigned by your ISP and will change periodically. If your ISP offers a dynamic IP address, the Quadro will act as a DHCP client and will receive a new IP address from the ISP's DHCP server or PPPoE feature.

**Please Note:** A DHCP client is a piece of software that requests an IP address from a DHCP server. A DHCP server assigns on request a unique IP address to a device. The Quadro, like many routers, acts as a DHCP client on its WAN interface and as a DHCP server on its LAN interface.

The Quadro must be visible to the Internet to be able to receive and send VoIP calls. When the Quadro is placed in a private network, typically behind existing routers, it will by default attempt to pass through the NAT of this router with its STUN (Simple Traversal of UDP over NAT) feature. STUN will work without user configuration with the majority of the basic routers. In some scenarios, port forwarding on the router is required to make the Quadro accessible to other Quadro devices and the Epygi SIP Server on the Internet. Another configuration option is to use the Quadro as the Internet access router, connected directly to the WAN, eliminating the traverse to the local NAT firewall.

## LAN / WAN Connection Options

- **A Quadro IP PBX with an Ethernet WAN port behind a router, which is connected to a cable or xDSL modem.**

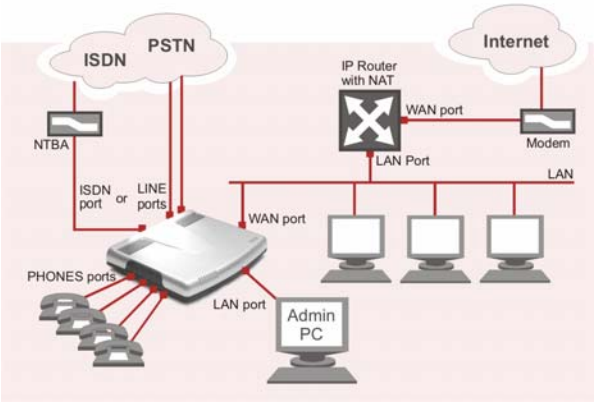



Fig. I-8: Configuration: Quadro behind a router

In this configuration, the IP router typically acts as a DHCP server for the LAN and assigns the IP addresses to the PCs and other devices. The Quadro can be connected through its WAN port directly to one of the router's LAN ports and will get an IP address from the router. By default, the Quadro acts as a DHCP client on the WAN port.

**Please Note: Since Quadro uses STUN by default, it will work with most basic routers without any further configuration.**

**Please Note:** Initially, the Admin PC must be connected to the Quadro LAN port to access Web Management of the Quadro. Later, this PC can be moved to the router's LAN. The Quadro Web Management can be accessed from any PC in the router's LAN as soon as firewall is disabled on the Quadro.

- **A Quadro IP PBX used as an Internet Access Router, connected directly to the Internet**

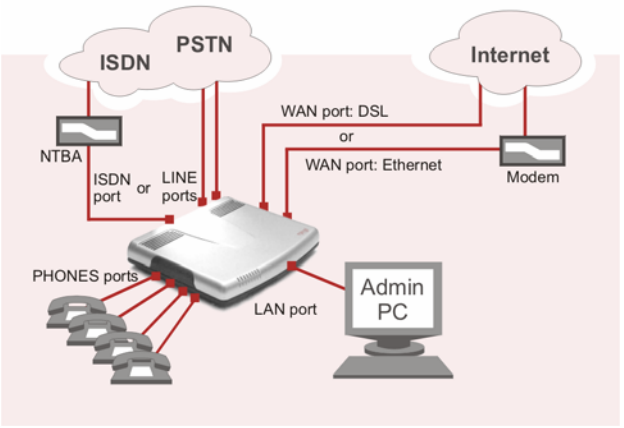



Fig. I-9: Configuration: Quadro used as Internet Access Router

**Please Note:** The Admin PC is connected to the Quadro LAN port to access the Web Management of the Quadro. After the initial configuration has been completed, this PC can then be moved to the LAN and connect to the Quadro over a switch (see following picture). You also may reach the Quadro for its first configuration from an Admin PC within the LAN , but this may cause collisions in case of non-fitting IP addresses and competing DHCP servers.

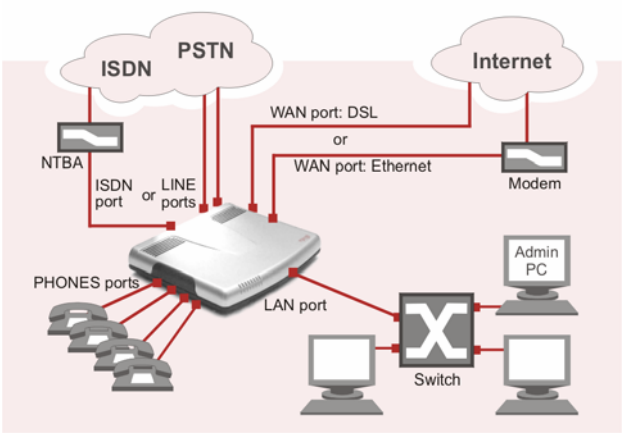



Fig. I-10: Configuration: Quadro used as Internet Access Router with a switch connected to the LAN port

If the user already operates a router connected to the cable or DSL modem and has devices behind the router, the router is disconnected from the modem and the Quadro is inserted between the modem and the router (see picture below). The Quadro serves as an Internet access router and DHCP server. The Quadro will be configured to connect directly to the Internet through a cable or DSL modem. The router then is connected to the Quadro LAN port.

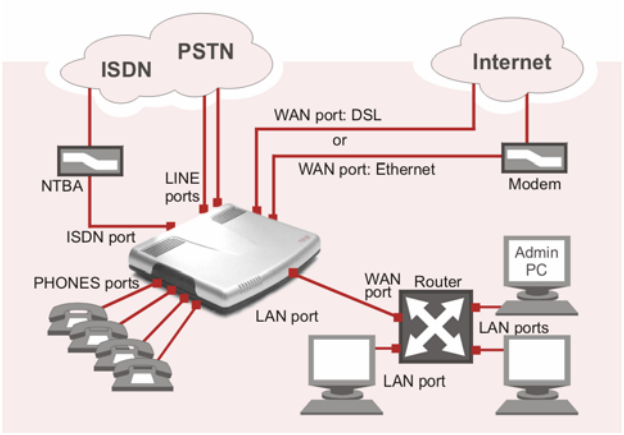



Fig. I-11: Configuration: Quadro used as Internet Access Router with a router connected to the LAN port

**Please Note:** If there are services configured behind the existing router such as Web or gaming servers, these services also must be configured through the Quadro firewall for proper operation. Refer to the Administrator's Guide for more information.

## Connecting the Hardware

- **Quadro4x behind a router**
  Quadro2x and Quadro16x are connected accordingly.

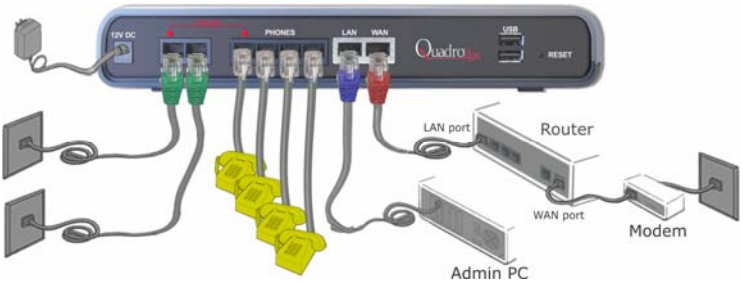



Fig. I-12: Installation: Quadro4x behind a router

- **Quadro4x used as Internet access router**
  Quadro2x and Quadro16x are connected accordingly.

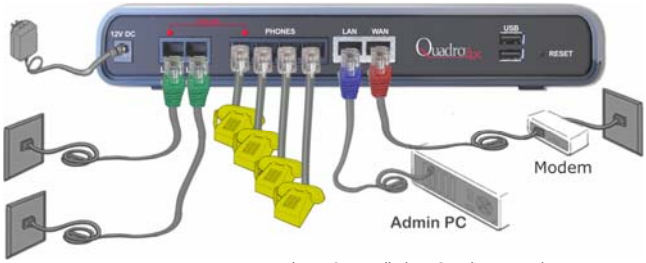



Fig. I-13: Installation: Quadro4x used as an Internet Access Router

- **Quadro4xi used as Internet access router**
  All Quadro ISDN IP PBXs are connected accordingly. They also may be connected with its Ethernet WAN port to a router (see above) and additionally, the ISDN ports of all Quadro devices may be joined to a PBX with ISDN interfaces.

Fig. I-14: Installation: Quadro4xi used as an Internet Access Router

- **Quadro4xa used as Internet access router**
  All Quadro IP PBXs using ADSL or G.SHDSL as their Internet uplink are connected accordingly.

Fig. I-15: Installation: Quadro4xa used as Internet Access Router

- Verify the product package contents are complete. Refer to the contents sheet included in the packaging to determine if all the items were shipped in the box.
- Before you connect the hardware, make sure that all devices are powered off.
- Connect telephones to the PHONE ports on the Quadro's rear panel. You may connect as many phones as PHONE sockets are available. PHONE socket 1 must be connected to a telephone to enable lifeline support functionality.
  **Please Note:** PHONES 1-3 (1-2 in case of Quadro2x) will ring simultaneously, if a PSTN call comes in. PHONE 4 is preconfigured for a fax machine.
- Connect at least one of Quadro's LINE (FXO) ports to the telephone service from the PSTN. The Quadro2x offers connectivity of one line, Quadro4x two lines, and the Quadro16x four lines. If you use a Quadro4xi, connect the Quadro's ISDN port to the digital telephone service (or to an ISDN port of a PBX).
  **Please Note:** If your Internet connection is a DSL modem, you may need to use a micro filter between the FXO LINE port and the phone line. Micro filters are typically provided by your ISP but are also available at most computer stores. If a micro filter is already installed, simply connect the RJ11 from the existing phone to the Quadro FXO port leaving the micro filter connection as is.
- Connect the Ethernet port on your PC via a straight CAT 5 cable with an RJ45 connector to the LAN socket of the Quadro. If a hub or switch is connected between the Quadro and your PC, use a crossover cable from the LAN interface of the Quadro to the hub/switch.
- Connect the WAN port of the Quadro to the Internet service via a cable or DSL modem.
- Power up the DSL or Cable modem first.
- Connect the power adapter to the POWER port on the Quadro's rear panel and plug the power adapter into a power outlet. Only use the original power adapter and plug it into a power strip with surge protection or to a UPS if available.
  The red LED (Fault) will glow for several seconds followed by the yellow LED (Info), which will glow for several minutes. When Info turns off, the Quadro is operational.
- Power up any hub or switch followed by any PC and other devices on the LAN side.
  **Please Note:** The PC must be configured for DHCP to receive an IP address directly from the Quadro. Refer to Appendix: PC DHCP Settings for instructions on setting up a PC for DHCP operation.
- Check the LEDs: The green Busy LED must glow continuously. The green LAN and WAN LEDs will blink when cables are connected to these ports and all devices are powered up. If the green LAN and WAN LEDs do not blink, verify cabling and ensure that all devices are powered up.
  **Please Note:** CAT 5 cables can be faulty without any visual indication. The LAN and WAN LEDs verify that the Ethernet connection is established between the end points. If these LEDs are not illuminated, there is a connection problem between the Quadro and the other device. Some modems, hubs, switches and routers will require the use of crossover cables.

# Step 2: Configuring the Quadro

## Quadro IP PBXs with Ethernet WAN uplink do not require further configuration in two cases:

- **The Quadro is connected behind a basic router which has not conflicts with the STUN protocol**.
- **The Quadro is used as the Internet access router and your ISP supports DHCP.** There are no other router devices between the Quadro and the DSL or cable modem and you get the IP address assigned automatically by the ISP.

Simply power up the modem; once the modem is up and running (after a few minutes) power up the Quadro.

Verify functionality of both IP and PSTN calls:

- **PSTN telephony:** Make an outbound PSTN call and arrange to receive an incoming call. The incoming PSTN calls will be routed to the Auto Attendant by default, and the caller has to enter a valid extension number, e.g., 11, followed by the # sign to reach a phone connected to the first PHONE port of the Quadro.
- **IP telephony**: Dial **899#** and you will hear a voice message that confirms you have successfully established an IP call. If this call is not successful, go to **Appendix: Checking the Connections** for troubleshooting.

You may customize the following settings by connecting the PC to Quadro's LAN port and logging in to the Quadro's Web Management:

- **Bandwidth** - to regulate the number of calls allowed by the Quadro to avoid degradation in low bandwidth conditions.
- **Time/Date** - to ensure the correct time and time zone are used for call records.
- **Regional Settings** - if your Quadro is located outside the United States, it is important to properly configure your line connections to the PSTN in your location.
- **Firewall** - if your Quadro is connected behind a router with own firewall service running, disable the firewall to make Quadro accessible for management purposes.

## Step 2.1: Logging in to Quadro

- Start a browser (MS Internet Explorer, Netscape, Opera) on a PC connected to the LAN port.
- Enter **http://172.30.0.1** (Quadro's default LAN IP address) into the address field.
- The **Login** page of the Quadro will be displayed (see picture below).

Fig. I-16: Login page

Enter **admin** as the Username and **19** as the password to log in as the administrator. Select the desired language. Once you log in, you will enter into the Quadro Management Menu.

**Please Note:** If you enter a wrong password and/or username for five times the device will be unavailable for login for five minutes.

After log in, the **Quadro Management** page will be displayed.

Fig. I-17: Quadro Management page

**Please Note:** The illustrations above and the following screenshots show the screens of a Quadro4x. The management screens of the other Quadro IP PBXs differ only slightly so here, the Quadro4x will be used as the reference system.

## Step 2.2: System Configuration Wizard

Select the **System Configuration Wizard** from the **System** menu. The **System Configuration Wizard** is a tool for the administrator to define the Quadro's Local Area Network settings and to specify regional configuration settings to make Quadro operational in its LAN. **The System Configuration Wizard must be run upon Quadro first startup.**

For the basic configuration, some pages in this wizard may be skipped and left default for the basic configuration.

**Please Note**: It is strongly recommended that factory default settings are left unchanged if their meanings are not completely clear.

## System Configuration

The first page shows all items to be configured. Click the **Next** button to start. Enter into the **Host Name** field a unique name for the Quadro device.

For a basic configuration, the **LAN IP address** needn't be changed, but if you must change it, e.g., to integrate the device into an existing LAN; record the new LAN IP address and have it handy. You'll need it for subsequent access to Quadro's management.

**Please Note:** The **Host Name** is very useful when many Quadro's are part of a network and one administrator has remote access to all of them. All Quadro pages show the hostname on the top right corner.

Fig. I-18: System Configuration page

Clicking **Next** shows the page **DHCP Settings for the LAN Interface**

## DHCP Settings for the LAN Interface

If the DHCP server is enabled, the Quadro will assign dynamic IP addresses to the stations connected to its LAN port.

If you didn't change the default LAN IP address of the Quadro, you also may leave the default values for the **IP Address Range**. Make sure your connected LAN devices belong to the same network as the LAN port of your Quadro.

**Please Note:** Make sure there is only one DHCP server on the LAN, otherwise, unpredictable network behavior can occur.

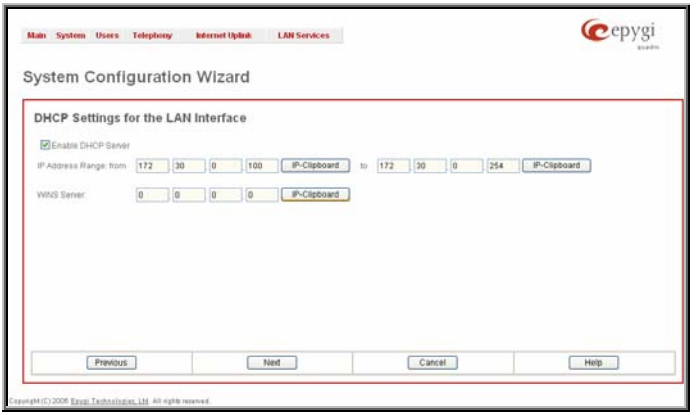



Fig. I-19: DHCP Settings for the LAN Interface page

Click on **Next** to display the **Regional Settings** page.

## Regional Settings

If Quadro is located outside the United States, it is important to properly configure your line connections to the PSTN in your location.

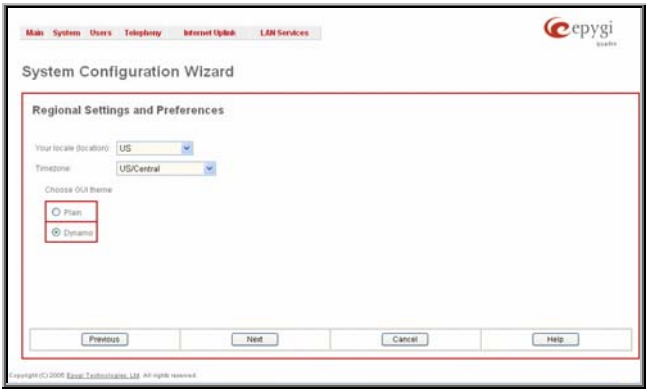



Fig. I-20: Regional Settings page

Proper configuration of Regional Settings is important for the functionality of the voice sub-

system. The Regional Settings determine the proper telephony parameters on the LINE (ISDN) and PHONE ports of the Quadro for the specified country. Select the country where the Quadro is located. If you do not find your country in the list, pick the closest in your timezone.

The Quadro obtains the correct time automatically over the Internet from a time server. If you are not located in the US / Central Standard Time Zone, you will need to change the **Timezone** to your region.

Click **Next** to show the **Emergency and PSTN Access Code Settings** page.

## Emergency and PSTN Access Code Settings

Fig. I-21: Emergency and PSTN Access Code Settings page

You may enter your local specific emergency codes into the appropriate field, i.e., in the US this is the well known 911, whereas in Germany 112,110 would be the correct numbers. In case of an emergency you can then pick up any FXS phone and dial your configured emergency code without any prefixes for PSTN calls (see Step 4: Making/Receiving Calls).

The PSTN Access Code is the prefix number you choose to dial to tell the Quadro to “make this call over PSTN” (see Step 4: Making/Receiving Calls). Users in the US will usually choose 9 here. European users usually would want to enter zero (0). If you do not enter anything into this field the currently configured PSTN Access Code will stay unchanged.

Click **Next** to show the summary page.

## Finishing the System Configuration Wizard

Fig. I-22: System Configuration Wizard finishing page

Click the **Finish** button to complete the System Configuration Wizard. The Quadro will then stop internal functions and apply the changes made in the Wizard.

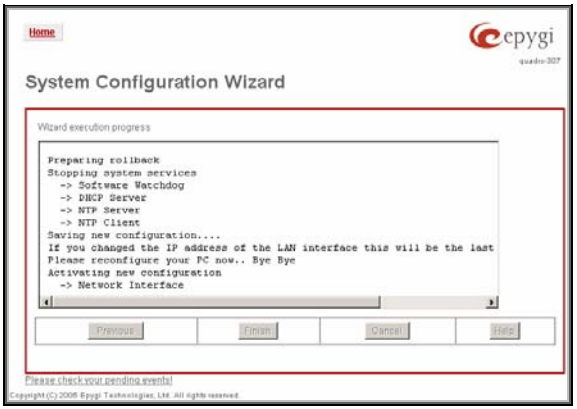



Fig. I-23: Wizard Execution Progress page

After this is complete, the Quadro will reply with the **Confirm Settings** page requesting confirmation of the changes. Press the **OK** button to confirm the settings.

Home
Confirm settings
Please press the 'Ok' button to confirm the settings.
If you don't press 'Ok' within 20 minutes after start the system
restores the previous configuration
Ok

Fig. I-24: Confirm Settings page

**Please Note:** you must confirm the settings within 20 minutes, otherwise the device will **revert back to the previous configuration and reboot**.

**Please Note:** If you do not use DHCP for your LAN and you have changed your LAN settings, make sure that the IP address of the PC connected to Quadro is still within the specified IP address range, otherwise your PC may not establish a connection to Quadro.

If you changed the network configuration of the LAN, restart your LAN connection to receive a new IP address from the new network. Then you can access the Web Management of the Quadro on the new IP address you've assigned to the Quadro.

## Step 2.3: Internet Configuration Wizard

Open the **Internet Configuration Wizard** by selecting the corresponding menu item on the **System** menu. The **Internet Configuration Wizard** is a tool for the administrator to configure the WAN settings and to adjust Quadro's connectivity in the global network. It must be run if Quadro is desired to be connected to the Internet.

The page **Getting Started** will be displayed:

Fig. I-25: Internet Configuration Wizard

This first page of the Internet Configuration Wizard is for informational purposes only and lists the items to be configured, Click on the **Next** button for the **Uplink Configuration** page.

Before configuring the WAN port to the Internet, you need to get the following information from your internet provider:

- Bandwidth - how much is available upstream and downstream?
- WAN IP Configuration - is DHCP supported? If yes, no more information is needed. If DHCP is not supported, the following data is needed: the WAN IP address, the subnet mask, the IP address of the standard gateway and the IP address of the Domain Name Server (DNS).
- MAC address - needed when the ISP requires a specific MAC address for the WAN.

Additionally, for Point-to-Point Protocol over Ethernet (PPPoE) WAN interface, you need to get the following information from your internet provider:

- PPP Configuration - does your ISP use a dynamic or fixed WAN IP address? If the WAN IP address is dynamic, no more information is needed. If the WAN IP address is fixed, you will have to enter it.
- Authentication - does your ISP require authentication? If authentication is required, information about the corresponding method (PAP, CHAP or MSCHAP) is needed including the username and password of the PPPoE account.

This information will be needed to be inserted in the Internet Configuration Wizard.

## Uplink Configuration

Select the desired WAN Interface Protocol and enter the **WAN Interface Bandwidth** to assure the quality of IP calls.

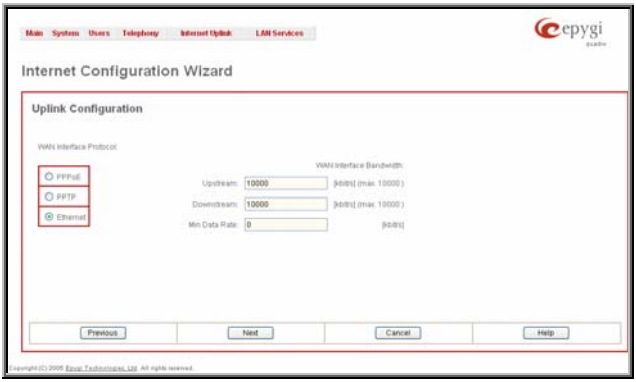



Fig. I-26: Uplink Configuration

If the available bandwidth is used to the point where the quality of an additional IP call would suffer, then new IP calls are rejected.

The bandwidth provided by your ISP must be specified for both **Upstream** and **Downstream** fields**.** The default entry in both fields is **10000,** the maximum bandwidth of the 10 MB uplink module. For basic DSL and cable modem service in the US, typical values are **300** for Upstream and **1500** for Downstream.

The **Min Data Rate** text field is used to specify the amount of bandwidth reserved for data applications. The value entered here needs to be smaller that the value specified for **Upstream Bandwidth**.

Specify the **WAN Interface Protocol** by choosing between available WAN interface protocols: **PPPoE** (Point to Point over Ethernet), **PPTP** (Point to Point Tunneling Protocol) and **Ethernet**. Use Ethernet for DHCP or static IP.

For **Ethernet**, clicking **Next** will display the **WAN IP Configuration** page**.** If **PPPoE** is the selected WAN Interface Protocol**,** the next page will be

**PPP/PPTP Configuration.** For **PPTP** WAN Interface Protocol, **PPP/PPTP Configuration** page will follow the **WAN IP Configuration.**

## WAN IP Configuration

Your Internet Service Provider (ISP) should provide this information.

- **Assign automatically via DHCP** - The parameters are set automatically by the ISP. This is common with cable modem and DSL service.
- **Assign Manually** requires the administrator to enter the external **IP Address**, the corresponding **Subnet Mask**, and the IP address of the **Standard Gateway**. This is common when you have a static IP address with your ISP.

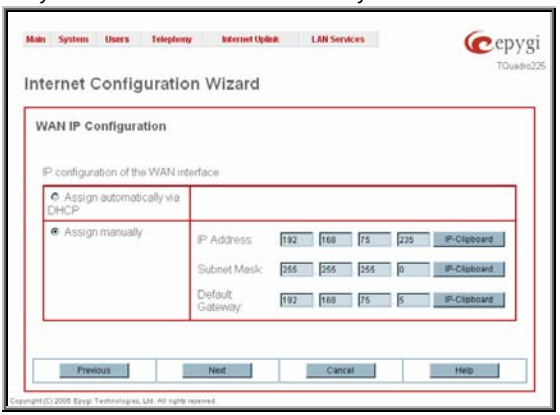



Fig. I-27: WAN IP Configuration page

Click the **Next** button to display the **WAN Interface Configuration** page.

## PPP / PPTP Configuration

Enter the IP address of the PPTP server into the **PPTP Server** text field.

Choose the encryption for the traffic over the PPTP interface from the **Encryption** drop down list.

**Authentication Settings** require the Username and the Password used for the authentication on the ISP server.

**Dial Behavior** radio buttons:

- **Dial Manually** - if this radio button is activated, a button will be displayed in the main management window that serves to switch the Internet connection on/off. When accessing the Internet, every station of the connected LAN has to connect to Quadro first.
- **Always connected** - Quadro stays in the always connected mode. This will allow remaining always online in the network.

The **IP Address Assignment** field is used to specify the external IP address given to the Quadro. Usually it is a dynamic address but in some cases you may be given a static IP address.

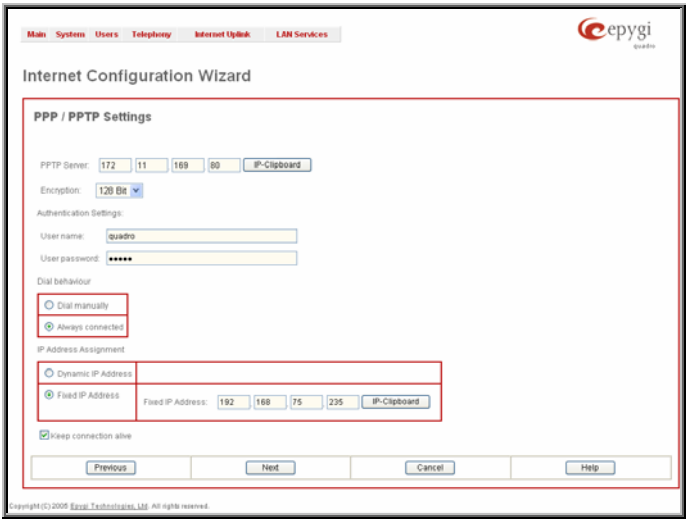



Fig. I-28: PPP/PPTP Configuration page

If your ISP assigns a dynamic IP address, activate the **Dynamic IP Address** radio button, otherwise activate the **Fixed IP Address** radio button and enter the IP address you were assigned by your ISP.

**Keep Connection alive** checkbox enables keeping the connection alive by sending control packets dedicated for the link state verification.

Click the **Next** button to display the **WAN Interface Configuration** page.

## WAN Interface Configuration

If your ISP requires a specific MAC address, e.g., for authentication, it can be entered on this page. The required MAC address can be entered into the **User defined** field. If a specific MAC address is not required, leave the default selection **This device** selected.

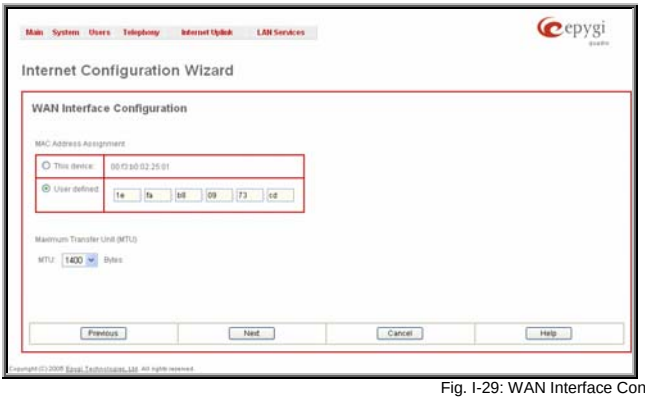



Fig. I-29: WAN Interface Configuration page

Use the **MTU** drop down list to select the maximum packet size on the Ethernet (in bytes). Click **Next** to display the **DNS Settings** page.

## DNS Settings

For DNS, the selection is set to **Dynamically by Provider**. When using a static IP address, fixed values must be entered.

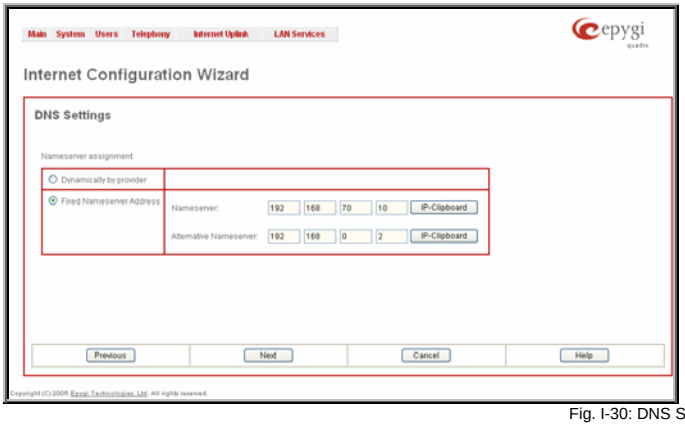



Fig. I-30: DNS Settings page

The Quadro will suggest the correct settings. If **Dynamically by Provider** is selected, the DNS server settings will be set automatically whenever a connection to the Internet is established.

If **Fixed Nameserver Address** is selected, manually enter the IP addresses provided by your ISP for the name server and the alternative name server.

Clicking **Next** shows the summary page of the Internet Configuration Wizard.

## Finishing the Internet Configuration Wizard

Main
System
Users
Telephony
Internet Uplink
LAN Services
epygi
Internet Configuration Wizard
Summary Page
All settings are done. By pressing 'Finish' you will
save and activate all settings
start the rollback feature
Depending on your IP settings it is possible that you cannot reach the device any more. You may have to reboot or reconfigure your PC.
ATTENTION: You have to confirm these settings on the main index page within 20 minutes. If not, the device will switch back to the previous configuration and reboot
Previous
Finish
Cancel
Help

Fig. I-31: Internet Configuration Wizard Summary page

Click the **Finish** button to complete the Internet Configuration Wizard. The Quadro will then stop internal functions and apply the changes made in the Wizard. After this is complete, the Quadro will reply with the **Confirm Settings** page requesting confirmation of the changes. Press the **OK** button to confirm the settings.

**Please Note:** the settings should be confirmed within 20 minutes; otherwise, the device will **revert back to the previous configuration and reboot**.

## Step 2.4: Firewall Configuration

By default, Firewall configuration on the Quadro has medium security, which denies any incoming traffic from WAN except the voice traffic.

Disabling the firewall is only required to access the Quadro's management when the Quadro is connected behind a router. To disable the firewall, open **Firewall Configuration** from the **Internet Uplink** menu. Disable the firewall by deselecting the corresponding checkbox and save changes.

Main
System
Users
Telephony
Internet Uplink
LAN Services
epygi
TQuadro225
Firewall Configuration
Enable IDS
Enable NAT
Enable Firewall
Low Security
Everything is allowed that's not explicitly forbidden!
This policy doesn't block anything per default. You have to configure the filters manually. This option is recommended if this device is already located behind another firewall or if you are sure that you have configured every filter correctly. Basic protection against the most common attacks (port scans, flooding, etc) is still provided with this policy.
Medium Security
Traffic originating from the LAN-side may pass and traffic from the WAN-side will be blocked per default. This is the recommended policy.
High Security
Everything that is not explicitly allowed will be blocked. This includes traffic from the LAN-side. You have to configure the filters to open up the firewall as desired.
Advanced Firewall Configuration
View Filtering Rules
Save
Back
Help

Fig. I-32: Firewall Configuration page

**Please Note:** The Enable IDS checkbox is not available for some Quadro IP PBX models.

# Step 2-A: Using IP Lines

The basic configuration procedure for Quadro IP PBXs that use IP lines is exactly the same as described in Step 2.

Before starting the IP Lines specific configuration, the appropriate IP Phone (the list of SIP phones supported by Quadro is presented below) should be connected to the LAN port of the Quadro.

Each IP line should be configured individually from the **Telephony** menu, **Line Settings** page, **IP Line Settings** tab.

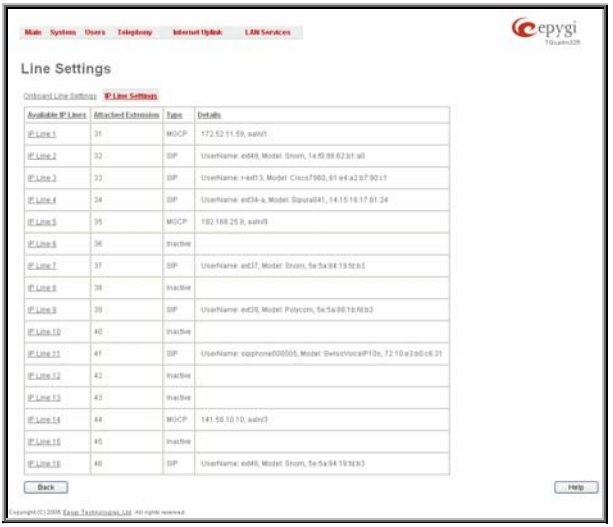



Fig. I-33: Line Settings page

Click on the IP Line number to enter the **IP Lines Settings** page.

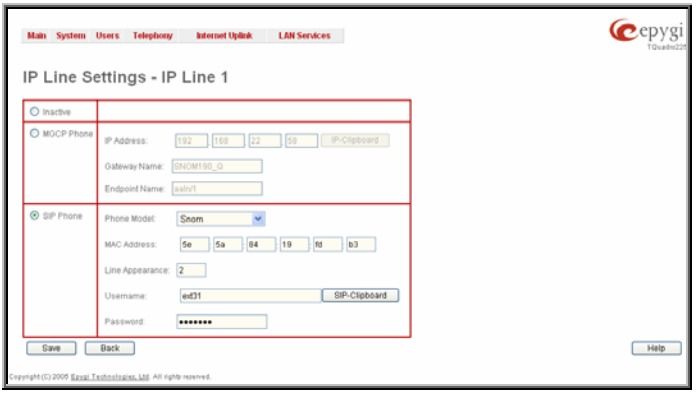



Fig. I-34: IP Line Settings page

Select the **SIP Phone** radio button. Select the SIP IP phone model from the **Phone Model** drop down list.

Insert the SIP Phone's **MAC address** in the corresponding fields. The MAC address of an IP phone is usually printed on the back of the phone's base unit.

In the **Line Appearances** text box, enter the number for simultaneous calls supported by the SIP IP phone – which is the sum of the number of active and held calls. For example, if this field is set to **1**, only one active call is possible to have on the phone and making or accepting a second call while the other is on hold will not be allowed. Note, that this number depends on the phone brand and model, and cannot exceed the number of simultaneous calls supported by the phone.

To simplify the configuration procedure, Quadro generates unique identification parameters (see **Username** and **Password**). You may use either these values or specify new ones.

Press **Save** to apply the settings for the IP line.

Reset the SIP phone. After restart, the appropriate configuration will be automatically downloaded from the Quadro to the SIP Phone.

**Please Note:** If you have decided to make the IP phone configuration manually, it is recommended to select the **Other** option from the Phone Model drop down list and to make the configuration manually on the SIP phone too. The SIP phone's configuration is different dependent on the SIP phone model. For more information about SIP Phone configuration, refer to the SIP phone manual or user's guide.

Some SIP phones require only reboot for configuration download, the others may require additional configuration. For example, by default IP Dialog SIP Tone II is in non-auto-provisioning mode, so the user has to manually enable it on the phone.

To make sure the configuration works properly, do the following:

- Go to **Quadro Status- SIP Registration status – Registered IP Lines** to see if IP Line registration is successful.
- Dial *74 to get the line information.
- Make outgoing and accept incoming calls.

To make the IP line functional, i.e. to be able to make/receive calls, refer to the Step 4 and Appendix: Registering on Epygi's SIP Server chapters, with the difference that the extensions should be attached to the configured IP line.

If an MGCP IP phone is connected to the Quadro's LAN, then the **MGCP Phone** radio button should be selected and the **IP Address**, **Gateway Name** and **Endpoint Name** fields should be filled with the appropriate information, taken from the MGCP Phone or provided by its administrator. The MGCP Phone configuration should be done manually in this case.

### Supported SIP Phones

Below is the list of SIP phones that can be automatically configured to work with Quadro2x/4x/16x:

- Snom 190 (Application version 3.60s)
- Snom 200 (Application version 3.56m)
- Snom 220 (Application version 3.56m)
- Snom 320 (Application version 4.2)
- Snom 360 (Application version 4.1)
- Polycom Soundpoint IP 300SIP (Application version 1.3.1)
- Cisco IP Phone 7960 (Image version 7.4 (P0S3-07-4-00))
- Swissvoice IP 10S (Application version IP10 SP v1.0.0 (Build 16))
- IP Dialog SIP Tone II (ST201) (Firmware Version SipTone 1.2.0 rc Z_21)
- Aastra 480i (Application version 1.3.0.1080)
- Sipura SPA-841 IP (Software version 3.1.4(a))

## Step 2-B: Using ISDN Lines

The basic configuration procedure for Quadro IP PBXs that use ISDN lines is exactly the same as described in Step 2.

As some ISDN providers require an outgoing MSN to be defined, go to the **Telephony** menu and open the **ISDN Settings** page:

Fig. I-35: ISDN Trunk Settings page

Before starting the ISDN Trunk configuration, please turn to your ISDN provider administrator to get the instructions which settings are necessary to be configured.

For each of the trunks in the ISDN Trunks table, following configuration should be performed. Edit trunk settings by selecting the appropriate trunk from the list and pressing **Edit** functional button from the ISDN Trunk Settings page toolbar.

Fig. I-36: ISDN Trunk - Edit page

The **Coding Type**, **LoopBackMode** and **Passive Mode** settings in the **Trunk # - Edit Entry** page should be set according to your ISDN provider requirements.

Run the **ISDN Wizard** for each ISDN trunk to make sure that all settings are proper. To access **ISDN Wizard**, select the appropriate trunk from the list and press **Settings** functional button from the ISDN Trunk Settings page toolbar.

**DDI** (Device Dialing Inward) service and **TEI mode** can be selected from the first page of the ISDN Wizard.

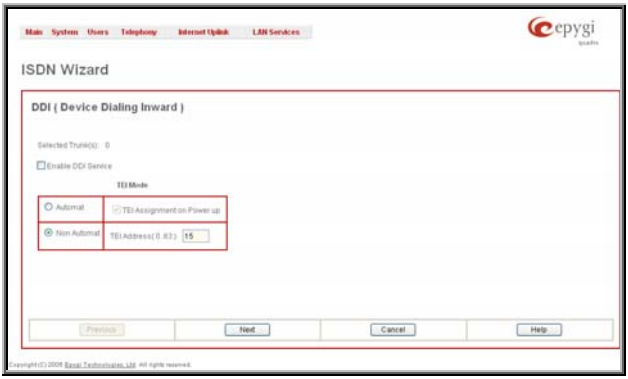



Fig. I-37: ISDN Wizard – Page 1

Leave **DDI Service** disabled if you wish to use MSN services (i.e. if you have more than one ISDN number provided by the Central Office). Configure **TEI mode** according to ISDN provider requirements.

Clicking **Next** will refer to the ISDN Wizard page where MSN Settings can be configured.

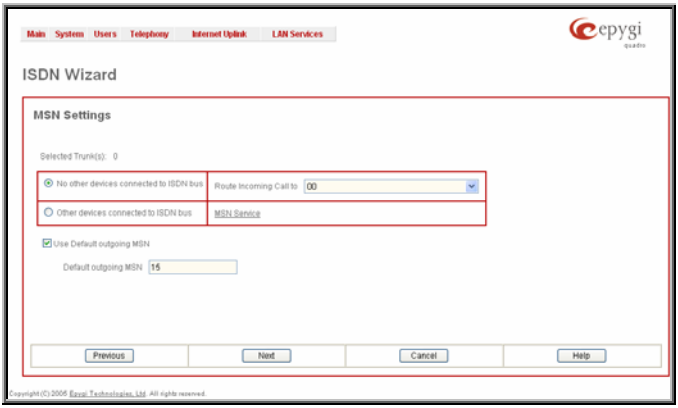



Fig. I-38: ISDN Wizard – Page 2

If you left **DDI Service** disabled, this page will offer you the select to use MSN services or not.

If you have one ISDN number assigned to the corresponding ISDN trunk, select the **No other devices are connected to ISDN bus** radio button and define the destination where to route the incoming calls.

If you have more than one ISDN numbers provided by the Central Office, select the **Other devices are connected to ISDN bus** radio button and press MSN Service link to configure MST table.

Select **Use Default outgoing MSN** checkbox and define the **Default Outgoing MSN** value if you wish to send the custom caller information when placing calls over the ISDN trunk. Clicking **Next** will move to the page where **L2&L3 Settings** might be configured.

**Attention:** If It is strongly recommended to consult with your ISDN provider before changing any of the settings on this page.

Fig. I-39: ISDN Wizard – Page 3

# Step 2-C: Using an ADSL or G.SHDSL Uplink

If a Quadro IP PBX with ADSL or G.SHDSL uplink is used, the basic configuration of the WAN interface slightly differs from the procedure in Step 2: pages **Uplink Configuration**, **PPP/PPTP Configuration** and **WAN Interface Configuration** have additional ADSL or G.SHDSL uplink interface specific components.

## Uplink Configuration Page

This page offers additionally the **PPPoA**, **1483R** or **1483B** WAN Interface Protocols to be selected:

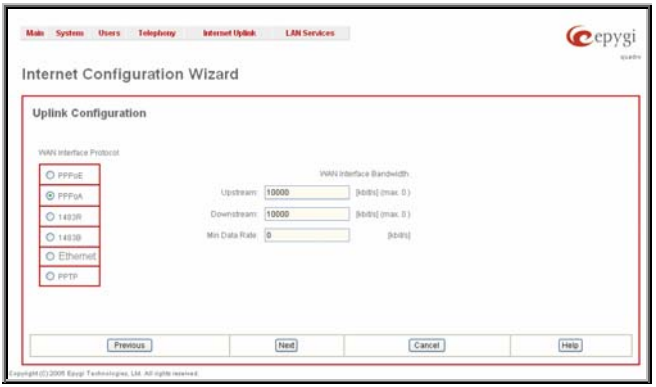



Fig. I-40: Internet Configuration Wizard - Uplink Configuration page for Quadro IP PBXs with ADSL Uplink

Enter the values requested by your ADSL or G.SHDSL provider for the **WAN Interface Bandwidth**.

## PPP / PPTP Configuration

Enter the IP address of the PPTP server into the **PPTP Server** text field.

Choose the encryption for the traffic over the PPTP interface from the **Encryption** drop down list.

**Authentication Settings** require the Username and the Password used for the authentication on the ISP server.

**Dial Behavior** radio buttons:

- **Dial Manually** - if this radio button is activated, a button will be displayed in the main management window that serves to switch the Internet connection on/off. When accessing the Internet, every station of the connected LAN has to connect to Quadro first.
- **Always connected** - Quadro stays in the always connected mode. This will allow remaining always online in the network.

The **IP Address Assignment** field is used to specify the external IP address given to the Quadro. Usually it is a dynamic address but in some cases you may be given a static IP address.

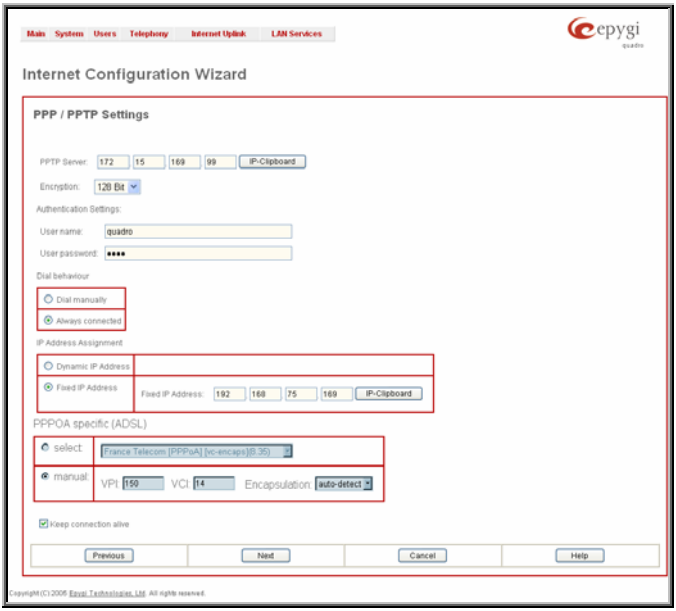



Fig. I-41: PPP/PPTP Configuration page

If your ISP assigns a dynamic IP address, activate the **Dynamic IP Address** radio button, otherwise activate the **Fixed IP Address** radio button and enter the IP address you were assigned by your ISP.

**PPPoA specific** selection is used to choose between manual or default ADSL or G.SHDSL connection parameters. For **Default** selection, the preconfigured parameter set can be selected from the list. For **Manual** selection, VPI, VCI and Encapsulation parameters should be specified manually. Please turn to the ISP administrator to get the corresponding settings.

**Keep Connection alive** checkbox enables keeping the connection alive by sending control packets dedicated for the link state verification.

Click the **Next** button to display the **WAN Interface Configuration** page.

## WAN Interface Configuration Page

If PPPoA or Ethernet is the selected WAN Interface Protocol, the **WAN Interface Configuration** page of the Internet Configuration Wizard shows additionally the **ATM Bridge Settings (ATM)** area.

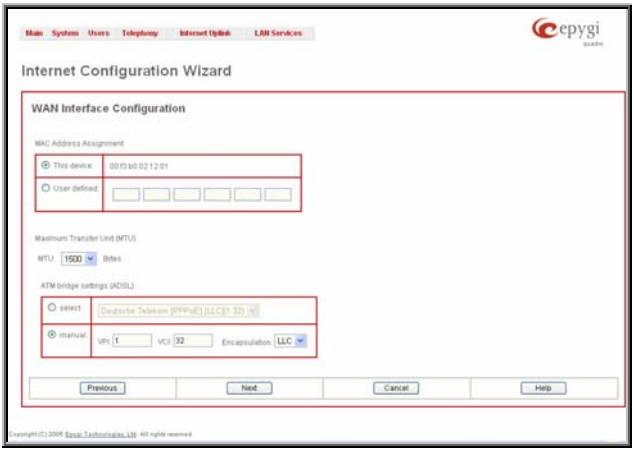



Fig. I-42: Internet Configuration Wizard - WAN Interface Configuration page for ADSL Quadros (PPPoA/Ethernet)

The **ATM Bridge Settings** manipulation radio buttons group is present if **PPPoA, 1483B** or **1483R** WAN Interface Protocol has been selected and if the Quadro has corresponding ADSL or G.SHDSL interface. Use **Default** selection to use the preconfigured parameter set or select **Manual** and define corresponding **VPI**, **VCI** and **Encapsulation** parameters should be specified manually.

Here, you may select from predefined settings of some ADSL or G.SHDSL providers. If you don't find your provider in this list, you need to select **manual** and enter the values for **VPI, VCI** and **Encapsulation** your ADSL or G.SHDSL provider requests.

# Step 3: Registering on Epygi's Technical Support

It is recommended that you register your Quadro on the Epygi Technical Support web page. Registration will give you access to the Technical Support Database. There, you can submit requests concerning technical problems as well as refer to the frequently asked questions. In addition, the technical support page allows users to download new firmware, manuals and other information. You can access the support section only if you are registered. Additionally, registration at Epygi's Technical Support web page gives you the username and password to login to the Epygi SIP Server.

To register, you need to know the serial number of your Quadro, which you will find on Quadro's bottom label and its purchase date. Next, open the Epygi home page (www.epygi.com), select **Support** and click on **Registration Form**. The online registration page will appear:

Complete all fields and record the **Login Name** and **Password** in a safe place. You will need it for the SIP server.

**Please Note:** In some cases, the Quadro units will be shipped pre-configured from the factory with the Support login and password already set up. In this case, an information sheet is included in the packaged contents indicating the username/ password to access Epygi's Online Support and the Epygi SIP Server.

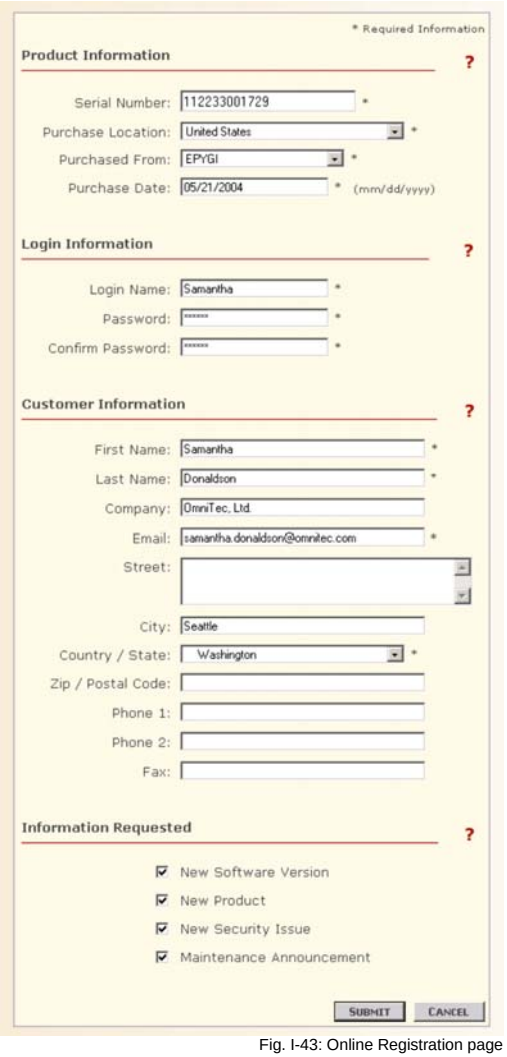



Fig. I-43: Online Registration page

# Step 4: Making/Receiving Calls

**Please Note: The Quadro default settings are sufficient to make SIP phone calls. It is not necessary to make any changes unless the user wants to create new SIP extensions on the Epygi SIP Server, create a private directory for several Quadro units, or use alternate VoIP services. Refer to the Administrator's Guide for more information on these configurations.**

- To make a call to the PSTN, lift the handset and dial **9** and the local phone number. You may accelerate the dialing process by adding the # after the last digit, e.g., 9 + 972-661-1335#. You are making a local call through the PSTN. It is assumed an FXO phone line is connected to the Quadro.

  **Please Note:** In case you had changed the default value of the **PSTN Access Code** in the System Configuration Wizard to something other than 9, you will need to dial your chosen digit instead.

- To make a VoIP call to a user on the remote Quadro, lift the handset and dial **8 + SIP Address** (of the user on the remote Quadro) **+ #**. You are calling over the Internet to a remote user.

  **Please Note:** Epygi has a SIP Address test line to test newly provisioned Quadro devices. Call **8 + 99 + #** and you will hear a message if the call was successful. This message comes from a Quadro in one of our offices. SIP Addresses are described below.

- Received IP calls will ring the extensions automatically.

- Received PSTN calls will be directed to the Quadro's default Auto Attendant (00).

## Using the Default SIP Addresses

Making Internet IP calls is simple with the Quadro. By default, every standard (analog) telephone connected to one of Quadro's phone lines functions as an IP phone. If you open the **Extensions Management** page, you will see that some **SIP Addresses** are available, one attached to the Auto Attendant and one to each extension. These SIP addresses are the IP telephone numbers of these extensions. Anyone with a Quadro or any other SIP IP device on the Internet can place a call to **SIPAddress@sip.epygi.com** and the call will ring the associated extension.

Under **Extensions Management**, you may edit the **Display Names** to assign extensions to people.

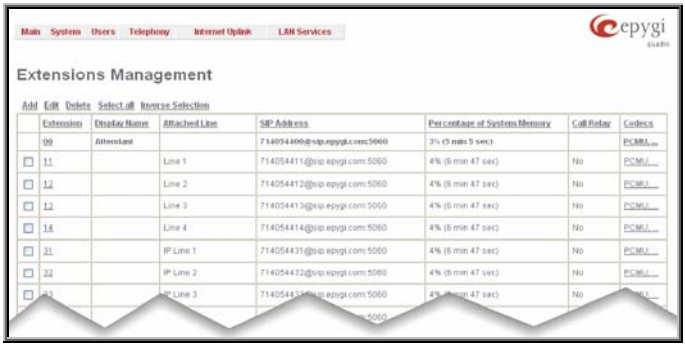

Main System Users Telephony Internet Uplink LAN Services
epygi
Extensions Management
Add Edit Delete Select all Inverse Selection
Extension Display Name Attached Line SIP Address Percentage of System Memory Call Relay Codecs
00 Attendant 3% (5 min 5 sec) PCMU,...
11 Line 1 714054411@sip.epygi.com:5060 4% (6 min 47 sec) No PCMU,...
12 Line 2 714054412@sip.epygi.com:5060 4% (6 min 47 sec) No PCMU,...
13 Line 3 714054413@sip.epygi.com:5060 4% (6 min 47 sec) No PCMU,...
14 Line 4 714054414@sip.epygi.com:5060 4% (6 min 47 sec) No PCMU,...
31 IP Line 1 714054431@sip.epygi.com:5060 4% (6 min 47 sec) No PCMU,...
32 IP Line 2 714054432@sip.epygi.com:5060 4% (6 min 47 sec) No PCMU,...
IP Line 3 No

Fig. I-44: Extensions Management page

To do so, click on the box in the first column next to the extension to edit and click the **Edit**

button. When the page opens, go to **General Settings** and edit the **Display Name** and click the **Save** button. Do not change any other settings at this time. For more information on the **Extensions Management** settings, refer to the Administrator's Guide and Appendix: Registering on Epygi's SIP Server of this document. The default SIP addresses are based on internal parameters unique to each Quadro device. If the Quadro undergoes a factory reset, the default addresses will be restored.

If you want to establish a dial plan between several Quadro units in a private group, refer to Appendix: Registering on Epygi's SIP Server, which describes how to change the default, SIP addresses on the Epygi SIP server and in the Quadro devices. With the directory service, you can create a private directory accessible from the Internet using a username/password. This service is enabled through the Epygi SIP Server.

# Appendix: PC DHCP Settings

The Quadro LAN port has a DHCP server that provides DHCP IP addresses to devices connected to the LAN either directly or through an Ethernet hub or switch. This appendix describes how to configure Windows PCs for DHCP. The PC used to access the Quadro must meet the following conditions:

- TCP/IP network protocol has to be installed.
- DHCP has to be activated in order to request the IP address automatically.

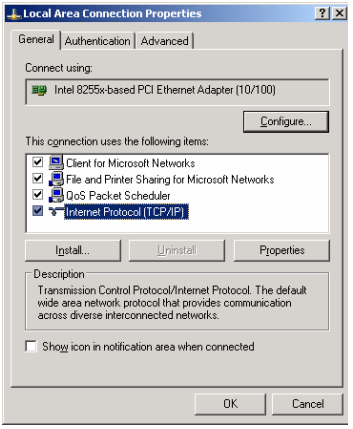
**Please Note:** If your PC is already configured for DHCP and connected directly to the Quadro, then simply power it on and verify the LAN LED is lit. If LED is off, check the cable connections.

Follow the instructions below to install TCP/IP and enable DHCP functionality:

## TCP/IP and DHCP under Windows 2000/Windows XP

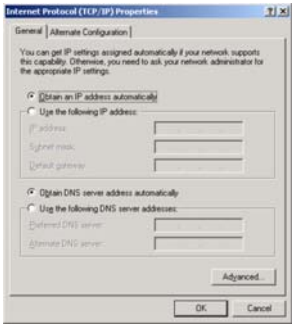
Windows 2000 and Windows XP PCs with Ethernet cards or adapters normally are configured with a TCP/IP network connection by default. Nothing in addition is required. To enable the DHCPs functionality, you may have to modify the properties of TCP/IP:

1. Click the **Start** button. Choose **Settings**, then **Control Panel**.
2. Double-click on the **Network Connection** icon to open the corresponding window. Select **Local Area Connection** with the right mouse button and select **Properties**.


Local Area Connection Properties
General Authentication Advanced
Connect using:
Intel 8255x-based PCI Ethernet Adapter (10/100)
Configure...
This connection uses the following items:
Client for Microsoft Networks
File and Printer Sharing for Microsoft Networks
QoS Packet Scheduler
Internet Protocol (TCP/IP)
Install... Uninstall Properties
Description
Transmission Control Protocol/Internet Protocol. The default wide area network protocol that provides communication across diverse interconnected networks.
Show icon in notification area when connected
OK Cancel

3. Highlight **Internet Protocol (TCP/IP)** under **General** tab and click **Properties**. The corresponding window will be displayed.

4. Choose **Obtain an IP address automatically** and **Obtain DNS server address automatically** selections and press **Advanced** button.


Internet Protocol (TCP/IP) Properties
General
Alternate Configuration
You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.
Obtain an IP address automatically
Use the following IP address:
IP address:
Subnet mask:
Default gateway:
Obtain DNS server address automatically
Use the following DNS server addresses:
Preferred DNS server:
Alternate DNS server:
Advanced...
OK
Cancel

5. You will see the entry **DHCP Enabled**.
6. Click **OK** three times to close all windows.

## TCP/IP and DHCP under Windows 95/98/ME

1. Click the **Start** button. Choose **Settings**, then **Control Panel**.
2. Double-click on the **Network** icon to open your Network window. Select the **Configuration** tab.
3. Click **Add**.
4. Double-click on **Protocol**.
5. Highlight “Microsoft” under the list of manufacturers.
6. Find and double-click on **TCP/IP** in the list to the right.
7. The Network window will appear with the TCP/IP protocol now listed.
8. Highlight “TCP/IP” and click on **Properties**.
9. Select **Getting IP address automatically** to enable the DHCP functionality.
10. Click **OK**.
11. Windows will ask you to restart the PC. Click **Yes**.

The TCP/IP installation is now complete and the DHCP functionality is enabled.

# Appendix: Changing the Admin Password

For security reasons, it is recommended that you change the default admin password. The username of the administrator (**admin**) cannot be changed.

To change the administrator password, go to the **System** menu, **User Rights Management**.

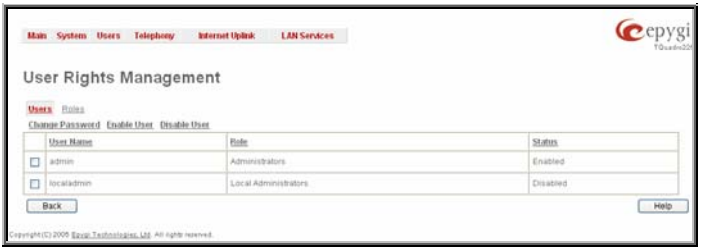



Fig. I-45: User Right Management page

Choose **admin** from the list and press the **Change Password** functional button from the User Right Management page toolbar.

The **Change Password** page will be displayed.

Fig. I-46: Change Password page

Enter the **Old Password** (19) and the **New Password** in both the **New Password** and **Confirm New Password** fields. Please note that only numeric digits may be entered here. Leave **Store password in persistent area (Factory reset save)** disabled.

Write down the password somewhere and keep it in a secure place. If the password is lost, a factory reset will be required on the unit (see Administrator's Guide, Hardware Overview). All settings are lost after a factory reset. After a factory reset the default password (19) will be restored.

# Appendix: Configuring NAT Traversal

NAT or Network Address Translation is a common feature used to expand the use of connected PCs and other networked devices without having to use multiple global Internet public IP addresses. Most ISP's will assign one public IP address to each customer that is connected to the Internet. The customer can use a router to provide NAT capability and create a private network of PCs and other devices not visible from the Internet. This method offers security and also eliminates the need to assign global Internet public IP addresses to each device on the LAN.

The Quadro initiates and receives SIP calls from the Internet (or the network connected to the WAN port). To receive SIP calls, the Quadro must be able to receive packets from the SIP server or any other device that is trying to make an incoming call. If the Quadro is placed behind a router with NAT, like most basic routers on the market today, the Quadro will not be able to receive calls. To resolve this issue, either STUN must be enabled on the Quadro or SIP NAT traversal must be set up in the router and in the Quadro to route the incoming calls properly.

**Please Note:** NAT traversal only works with Internet connections that have static IP addresses. Verify from your provider that this is the case for your Internet connection. Some ISPs provide dynamic IP addresses that may change from time to time, and are not appropriate for SIP NAT traversal.

**Please Note:** If you have more than one router in series between the Quadro and the Internet, the same port forwarding setup must be configured on each router.

**NAT Traversal Setup**

- Install the Quadro behind the router. If the Quadro is configured with its factory default settings, it is already configured for DHCP and will obtain an IP address automatically from the router.
- Connect a PC to the Quadro LAN port and power it up.
- Verify the Quadro can connect to the Internet by opening a browser window and browsing to a familiar WEB site. If the Quadro cannot reach the Internet, verify the LAN/WAN LEDs and the cabling. Verify the Quadro is set up for DHCP on the WAN and that the router has the DHCP server enabled for the devices behind it.
- Find the address of the router and log into the router. Refer to the router's user manual on how to open the router configuration.
- Set up port forwarding on the router to forward UDP ports 5060, 6000-6099 to the IP address assigned to the Quadro. You can see the IP address of the Quadro in the **System** menu under **Status**, submenu **Network Status.** The IP address will be listed as the WAN IP address. Your router also may indicate the IP address assigned to the Quadro.
- Find out the public Internet address (WAN IP address) of the router. To do so, open a browser and go to www.whatismyip.com. The site will return your public Internet IP address. Record this IP address.

- From the **Telephony** menu of the Quadro Management go to the **NAT Traversal Settings** page, go to **General Settings** and set the and enable **NAT Traversal for SIP** radio buttons selection to **Force**. **Save** the selection.

Fig. I-47: NAT Traversal Settings – General Setting

Go to **SIP Parameters** page.

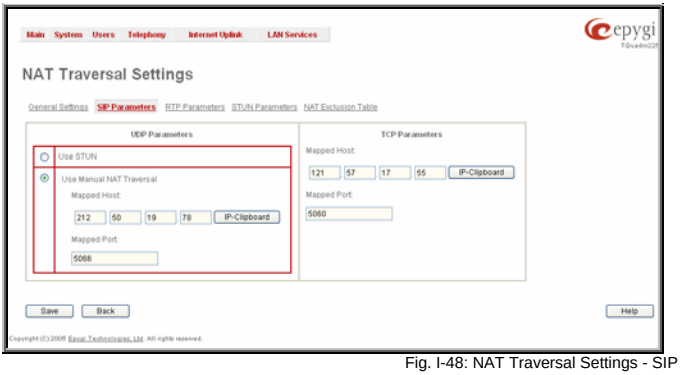



Fig. I-48: NAT Traversal Settings - SIP Parameters

Select **Use Manual NAT Traversal** and enter the WAN IP address of the router into the **Mapped Host** text field. For **Mapped Port**, enter the router's corresponding port number, in this case **5060**. **Save** the entries.

- Go to **RTP Parameters** page and select **Use Manual NAT Traversal.**

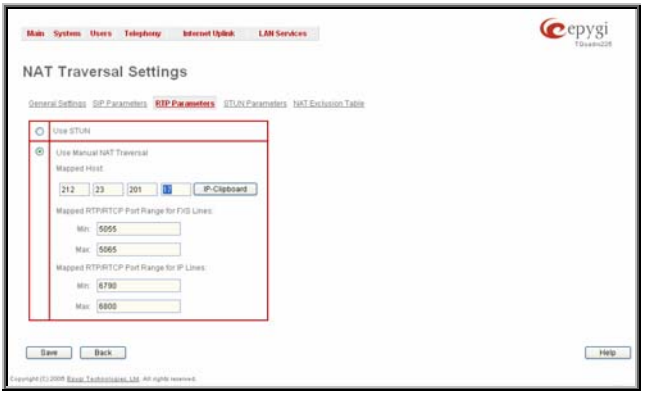



Fig. I-49: NAT Traversal Settings - RTP Parameters

- Enter the WAN IP address of the router into the **Mapped Host** text field. Set the **Mapped RTP/RTCP Port Range for FXS lines** and the **Mapped RTP/RTCP Port**

**Range for IP lines** according to the values specified on the router, in this case to **6000 (Min)** and **6049 (Max)** and **6050 (Min)** and **6065 (Max),** respectively. Click the **Save** button to save the contents.

The Quadro will activate the settings and register the extensions on the Epygi SIP Server after a few minutes. You can verify the settings from the main **Quadro Management** menu under **Status** in the **SIP Registration Status** section.

# Appendix: Registering on Epygi's SIP Server

You may login directly to Epygi's SIP Server if you have registered your Quadro at Epygi's Technical Support Center. If you have not registered with Epygi Technical Support, you cannot login to the Epygi SIP Server.

Using the same login name and password you used for Epygi Support, login to the Epygi SIP Server at **www.epygi.com** under **SIP**, **Login here.**

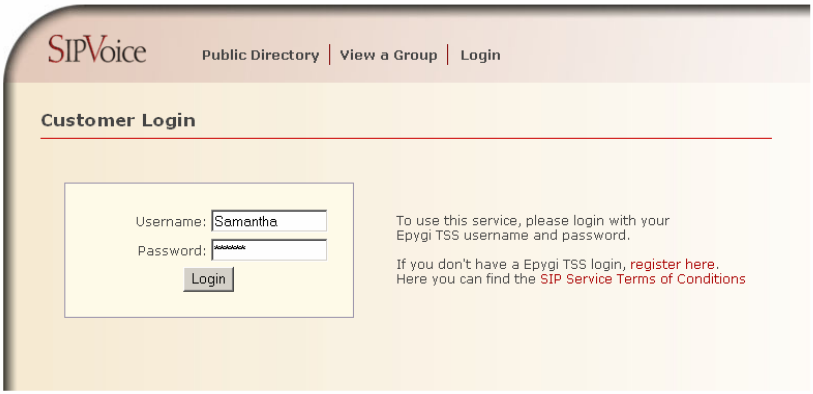

SIPVoice
Public Directory | View a Group | Login
Customer Login
Username: Samantha
Password:
Login
To use this service, please login with your Epygi TSS username and password.
If you don't have a Epygi TSS login, register here.
Here you can find the SIP Service Terms of Conditions

Fig. I-50: SIP Services Login page

Read the **SIP Service Terms and Conditions** and accept it to proceed. The displayed page now welcomes you and allows you to **Subscribe a New Extension**.

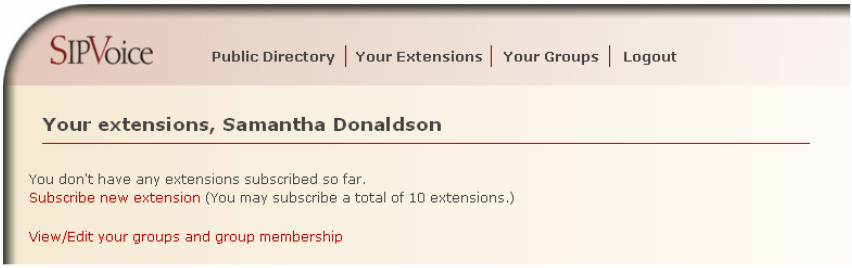

SIPVoice
Public Directory | Your Extensions | Your Groups | Logout
Your extensions, Samantha Donaldson
You don't have any extensions subscribed so far.
Subscribe new extension (You may subscribe a total of 10 extensions.)
View/Edit your groups and group membership

Fig. I-51: SIP Services Welcome page

Selecting **Subscribe a New Extension** leads you to a page where you can enter the user information as shown below. The **Extension Nr.** is the eight digit SIP number assigned to your extension. The first five are fixed by the SIP Server and cannot be changed and the last three are user defined. Notice the check box to enable this extension to be shown in the Epygi **Public SIP Directory**.

**Please Note:** If you enable this extension to be shown in the Epygi **Public SIP Directory**, all information related to this extension will be published in the Public SIP Directory, which is accessible by anyone from the Internet. To maintain privacy, do not check this box.

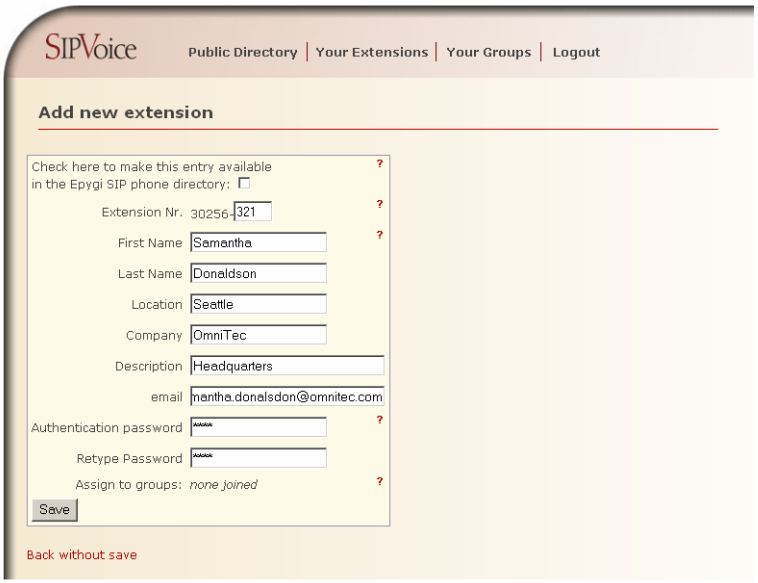



Fig. I-52: SIP Services Add New Extension page

The **Authentication password** validates the entry and must match the password entered on the Quadro later. Make sure to record the name, Authentication Password and SIP extension number for entry into the Quadro later.

**Save** will store the entered information and conclude the basic SIP registration. The following page then will be displayed:

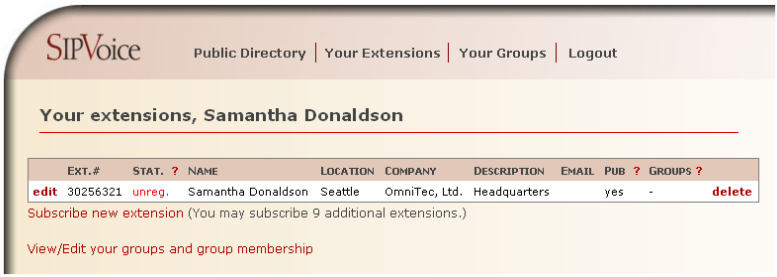

SIPVoice
Public Directory | Your Extensions | Your Groups | Logout
Your extensions, Samantha Donaldson
EXT.# STAT. ? NAME LOCATION COMPANY DESCRIPTION EMAIL PUB ? GROUPS ?
edit 30256321 unreg. Samantha Donaldson Seattle OmniTec, Ltd. Headquarters yes - delete
Subscribe new extension (You may subscribe 9 additional extensions.)
View/Edit your groups and group membership

Fig. I-53: SIP Services Your Extension page

This table shows **unreg.** in the **Stat**. column. This entry will change to **reg**. when the required settings in the Quadro are complete and the Quadro successfully registers on the SIP Server.

Repeat this for all four extensions on the Quadro and the Auto Attendant.

## Configuring Quadro Extensions

Once the SIP server has the created extensions with the user information, create these extensions in the Quadro devices. Once they are entered in the Quadro, they will be registered and can then be used.

Login into the Quadro and go to **Extensions Management**.

Main System Users Telephony Internet Uplink LAN Services
epygi
Extensions Management
Add Edit Delete Select all Inverse Selection
Extension Display Name Attached Line SIP Address Percentage of System Memory Call Relay Codecs
09 Attendant 714054409@sip.epygi.com:5060 3% (5 min 5 sec) PCMU,...
11 Line 1 714054411@sip.epygi.com:5060 4% (6 min 47 sec) No PCMU,...
12 Line 2 714054412@sip.epygi.com:5060 4% (6 min 47 sec) No PCMU,...
13 Line 3 714054413@sip.epygi.com:5060 4% (6 min 47 sec) No PCMU,...
14 Line 4 714054414@sip.epygi.com:5060 4% (6 min 47 sec) No PCMU,...
31 IP Line 1 714054431@sip.epygi.com:5060 4% (6 min 47 sec) No PCMU,...
32 IP Line 2 714054432@sip.epygi.com:5060 4% (6 min 47 sec) No PCMU,...
33 IP Line 3 714054433@sip.epygi.com:5060 4% (6 min 47 sec) No PCMU,...

Fig. I-54: Extensions Management page

Select the first extension to change by clicking the appropriate checkbox and press **Edit** functional button. **Extensions Management – Edit Entry** page will be displayed.

Go to **General Settings** page and adjust the **Display Name** as needed.

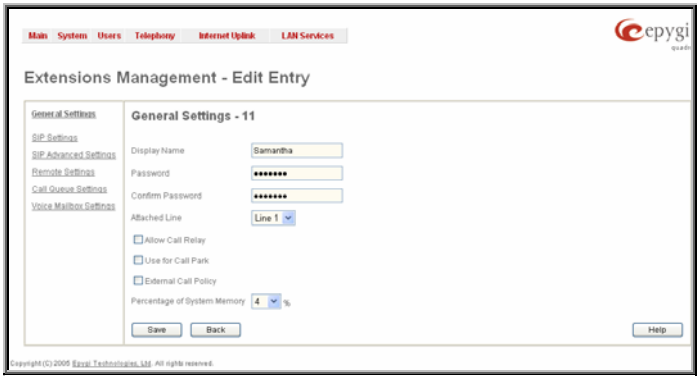



Fig. I-55: Extensions Management - Edit Entry – General Settings page

Go to **SIP Settings** page to enter the **SIP Registration Settings** you received from the Epygi SIP server:

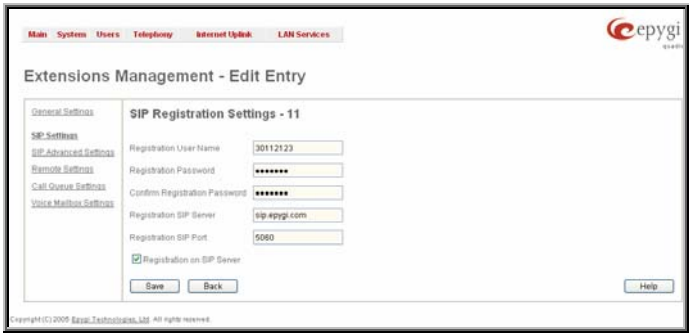



Fig. I-56: Extensions Management - Edit Entry – SIP Settings page

- Enter the SIP registration number displayed in the column **Ext#** into the text field **Registration User Name**.
- In the **Password** field, enter the password you specified when registering at the SIP server and confirm it in the field below.
- In **Registration SIP Server,** the selected SIP server address must be entered. If you use the Epygi SIP server, you may leave the default entry **sip.epygi.com**.
- Most SIP server providers, including Epygi, use port 5060 as the **Registration SIP Port**. You may leave the default entry as is.
- Select **Registration on SIP Server** if you want to establish and receive IP calls.
- Click the **Save** button to activate the settings.

Other settings of the extension might be also modified from **Extensions Management – Edit Entry** page (refer to the Administrator's Guide).

Your settings will be verified, then after a few seconds the **Extensions Management** page is updated with the changes as shown in the below example.

Main System Users Telephony Internet Uplink LAN Services
epygi
Extensions Management
Add Edit Delete Select all Inverse Selection
Extension
Display Name
Attached Line
SIP Address
Percentage of System Memory
Call Relay
Codecs
00 Attendant
11 Samantha Line 1 30112123@sip.epygi.com:5060 4% (5 min 47 sec) No PCMU,...
12 Line 2 714054412@sip.epygi.com:5060 4% (5 min 47 sec) No PCMU,...
13 Line 3 714054413@sip.epygi.com:5060 4% (5 min 47 sec) No PCMU,...
14 Line 4 714054414@sip.epygi.com:5060 4% (5 min 47 sec) No PCMU,...
31 IP Line 1 714054431@sip.epygi.com:5060 4% (5 min 47 sec) No PCMU,...
32 IP Line 2 714054432@sip.epygi.com:5060 4% (5 min 47 sec) No PCMU,...

Fig. I-57: Extensions Management page

- If you go back to Epygi's SIP Server, you will find the value **reg.** for this number in the column **Stat**. **Reg**. This will indicate that the Quadro has successfully registered the new number. If this does not happen after a few minutes, again verify the SIP Number and passwords.

# Appendix: Checking the Connections

If the system doesn't seem to be working properly, even when all the cables are connected properly, it may be helpful to **Start Network Diagnostics:** The WAN link, IP configuration, gateway, DNS server, and STUN-NAT will all be checked.

To start diagnostics, open the **System's** menu item **Diagnostics** and click **Start Network Diagnostics.**

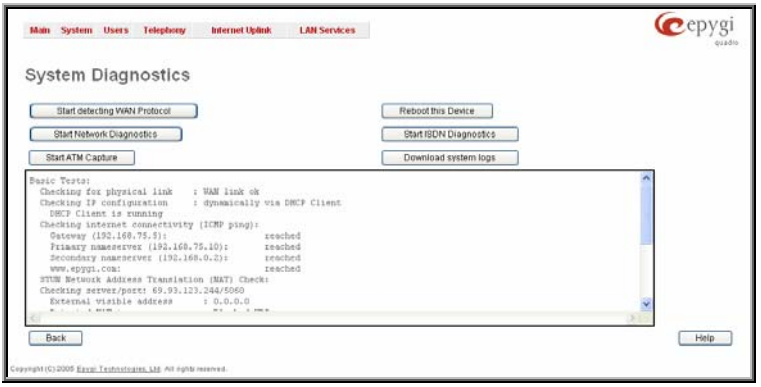



Fig. I-58: System Diagnostics - Network Diagnostics page

If the test passes, the output of the system may look as follows:

```
Basic Tests:
  Checking for physical link:                WAN link ok
  Checking IP configuration:                 dynamically via DHCP Client
    DHCP Client is running
  Checking internet connectivity (ICMP ping):
    Gateway:               reached
    Primary nameserver:    reached
    Secondary nameserver: not configured
    www.epygi.com:         reached
  STUN Network Address Translation (NAT) Check:
    External visibible address: 212.126.210.179
    Detected NAT type         : Restricted cone

  Performing MTU Discovery:
    preparing system
    Sending UDP Datagram of size 1500        got answer
    clean up

  Largest usable MTU size is: 1500 Bytes

Test successful.
```

Depending on where the test is failing, the diagnostic can give some advice on how to solve the problem. See the example below of a failed test:

```
Basic Tests:
  Checking for physical link:                no WAN link
```

```
Please check the physical connection of the WAN interface. Cable not
plugged or broken?

Test failed.
```

If diagnostics are successful, but you are still unable to place a call to 899# then check the SIP registration status.

Open the SIP Registration Status page using the Quadro management **System** menu item **Status**. Besides the SIP registration information for the auto attendant and each connected extension, the Detected Connection Type is shown. If Quadro is placed behind a NAT router and the STUN is enabled, the detected connection type and the IP address of this router's WAN port are displayed.

Fig. I-59: SIP Registration Status page

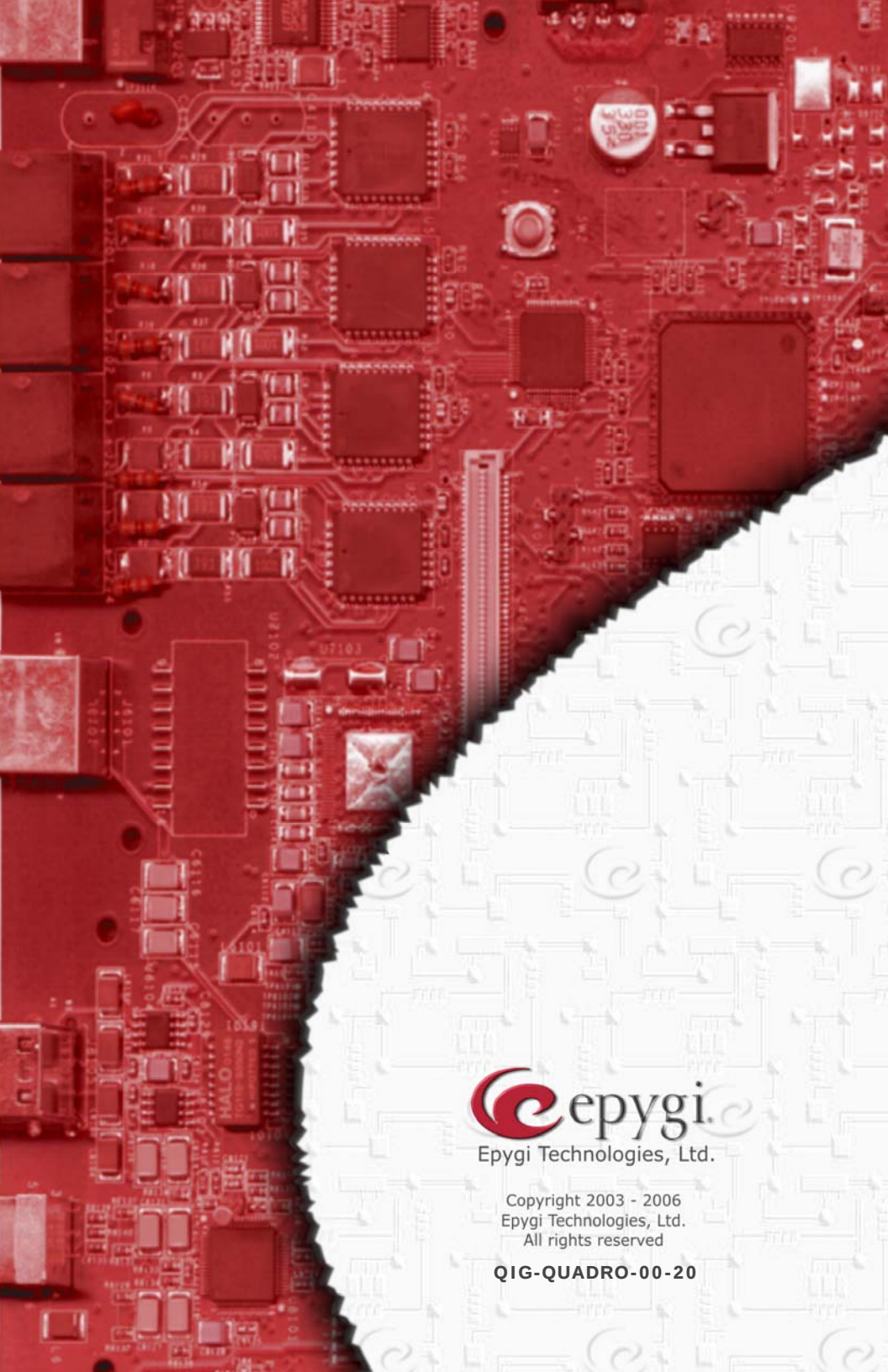
Quadro cannot work behind your router if **Detected Connection Type** is one of the following:

- Unknown connection - unexpected error
- Symmetric NAT
- Symmetric Firewall
- Blocked UDP

If you get one of the above mentioned Detected Connection Types, either connect the Quadro in front of the router, or configure NAT traversal manually as explained in **Appendix: Configuring NAT Traversal**.

If you are unable to resolve your problems, please send us a technical support request on the **Support** section of **http://www.epygi.com/**. Please prepare a system log file and attach it to your request.

(To download the system logs, open the **System Diagnostics** page **System** menu item **Diagnostics**) and click **Download System Logs**.



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**QIG-QUADRO-00-20**